

Arkansas Department of Education

Technology Plan 2008-2012



**Prepared by the
Arkansas Department of Education
Research and Technology Section
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Introduction

The first Arkansas Department of Education Technology Plan was adopted in July of 2000. It was developed by the Governor's Educational Technology Planning Committee, which represented members from a wide range of state agencies, local districts, and legislative panels. It served the purpose of identifying the broad needs of education technology in Arkansas.

This revision to the original plan represents an effort to provide more detail regarding specific technological solutions for all levels of the educational system. The primary focus of this plan is use technology to enhance instructional opportunities and increase student achievement. Technology integration and support mechanisms are now widely recognized as critical elements in successful efforts to improve student and school performance.

The technology planning committee that updated the original technology plan recognized the importance of such factors as: 21st Century Skills, National Education Technology Standards, deployment of the K-12 video network, increased demand for additional bandwidth and changes in local, state, and national priorities, as well as new and developing technologies when developing the plan.

The committee encourages the utilization of this plan as a guide for the development of technology plans by local school districts and education service cooperatives.

Committee Membership

The technology planning committee included key representatives from the Arkansas Department of Education, Education Service Cooperatives, Arkansas Educational Television Network, Department of Information Systems, Arkansas Public School Computer Network, and Higher Education. The Arkansas Department of Education appreciates the diligent work and dedication of these committee members.

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Executive Summary

The Arkansas Department of Education Technology Plan provides policy makers, school districts, education service cooperatives and institutes of higher education with a blueprint that guides and facilitates future state and local technology planning, funding, implementation, and evaluation. The 2008 Plan builds on the progress of the last five-year plan. It continues to promote technology access, use, professional development, and partnerships. It also addresses technology and digital age literacy, problem solving, creativity, collaboration, and high productivity skills essential for Arkansas school districts in a rapidly changing global economy.

Technology is the foundation on which many of the educational applications will be built in the future. It is imperative that educators and students see technology as another tool for providing the best educational opportunities possible for all students. It is therefore necessary for education systems in Arkansas to review their technology plans with a vision to the emerging technologies that will be used to prepare students and educators to thrive in a digital age and be proficient in the skills of the 21st Century. The primary focus of the plan is to enhance instruction that promotes higher student achievement through technology and to provide a framework for this to occur.

Vision:

Arkansas learners will have equitable access to learning environments that infuse technology into the teaching and learning process, ultimately producing life-long learners who will succeed socially and economically in a society increasingly dependent on technology and information.

Mission:

The mission of the Educational Technology Plan is to

- ◆ Promote student centered learning environments that are rich in technology.
- ◆ Empower faculty to use technology as a tool to enhance learning.
- ◆ Ensure that students and faculty become technology literate and productive in a digital society.
- ◆ Engage education and community-based technology providers in collaboration efforts.
- ◆ Allow school personnel immediate access to the tools, data, and information needed to make educational decisions and continual education learning.
- ◆ Serve as the documentation required by the United States Department of Education to obtain federal technology funding.

Goals

The five major goals of this technology plan are listed below. They are the foundation necessary to achieve the vision and complete the mission of the plan. It is imperative that the plan has the flexibility to allow for new ideas, services, products, and projects that may need to be created over the life of the plan.

Goal 1: School districts will equitably allocate fiscal, staff and professional development resources to ensure that the acquisition, maintenance and use of high quality learning technologies are available to support student achievement.

Goal 2: Each school district will develop, implement and evaluate a plan for technology use that: supports the achievement of high performance standards including those of technology literacy by students, teachers and other educational professionals; includes federal mandated protection from inappropriate materials; and ensures that every school has access to digital content and professional development in using technology across the curriculum.

Goal 3: The state and school districts will develop a robust and reliable security network infrastructure that is capable of supporting advance information and educational technology for learning, teaching, and research.

Goal 4: Arkansas state funds and federal technology funding streams will be aligned with other state efforts to support high need and low resource schools in obtaining the fiscal resources needed to purchase, install and maintain up-to-date technology hardware and software.

Goal 5: The Arkansas Department of Education will seek ongoing input, feedback and assistance from representatives of all sectors of the education community as well as community-based technology providers to collaboratively develop, implement, evaluate, and revise the educational technology plan for Arkansas.

Local Technology Plans

PURPOSE:

Act 999 of 1999 required each school to develop a comprehensive, long-range school improvement plan focused on student achievement. The improvement plan had to be designed to assist those students performing below grade level in achieving expected educational standards. Local school districts had to have a comprehensive, long-range, district wide technology plan for implementing educational technology initiatives that supported the school improvement plan. The district technology plan was to be closely associated with the school improvement plans.

The following factors indicate the need for a comprehensive plan:

- Compatibility required for access to communications networks (local, state, national, and international).
- Level of expertise required for efficient and effective planning, implementation, and support.
- Cost of hardware and software (compatibility and volume purchasing).
- State and federal requirements (E-Rate, grants).

GOAL:

Each district will develop a comprehensive technology plan that supports the school improvement plan of each school within the district.

OUTCOMES:

Schools meeting this goal will demonstrate the following:

- Technology initiatives that help the district meet its school improvement goals.
- An approved plan that makes districts eligible for state and federal technology funds.
- Differentiation among instructional and administrative applications within the plan.
- Input and contribution from committed stakeholders in the development of the plan (teachers, support staff, administrators, parents, local business, school board, students, etc).
- Engagement in technology planning that focuses on the integration of information technology in teaching and learning.
- Availability of qualified local staff to support the technology plan.
- Continuous assessment and yearly review of the plan.

TECHNOLOGY PLAN EMPHASES:

Emphasis 1:

The district plan examines the goals set forth in the individual comprehensive improvement plan and identify ways in which technology can be utilized to achieve the goals set forth in these plans. Technology is one intervention utilized to help meet the goals defined by the school improvement plan. Other interventions would include curriculum alignment, parental engagement, professional development, evaluation, equity, and collaboration.

Emphasis 2:

Local plans must address the state technology standards for teachers, students, and administrators as well as technology-specific courses. Districts must address which technology courses will be required and how the district will assess the student's proficiency in technology.

Emphasis 3:

Professional development is a critical part of the district technology plan. Professional development should be a coordinated set of planned, research-based best practices, learning activities for teachers and administrators, which are standards-based and continuous. The professional development plan should help in developing and sustaining the technology skills of educators, which will enhance teaching, learning, management, and leadership in the education community.

Emphasis 4:

Teaching and learning must be supported by management tools that are appropriate, efficient, and cost effective for the district.

Emphasis 5:

In order for instructional staff and support services to successfully utilize technology, the district must have access to competent and timely technical support. The district plan must include a strategy for the installation, replacement, and maintenance of hardware, software, and networking.

Emphasis 6:

Updates to existing plans must be completed and submitted yearly to the Arkansas Department of Education.

TECHNOLOGY PLAN COMPONENTS:

A district technology plan that supports an integrated K-12 technology program will include the following components:

- Vision and Mission Statements
- Goals
- Inventory of Existing Programs and Technologies by School Campus
- Curriculum and Instructions (School improvement plans are the basis for this component)
- Staff Development
- Infrastructure
- Action Plans (Including timeline and implementation schedule)
- Hardware and Software Purchases
- Technical Support
- Inventory Tracking
- Technology Budget
- Acceptable Use Policies
- Monitoring and Evaluation

Goal 1: Each district will develop a comprehensive technology plan that supports the school improvement plan from each school within the district.

Goal 2: Learning technologies will be widely and equitably used in every school building to support the engagement of students, teachers, administrators, parents, and the community in helping all students to achieve high education standards.

Goal 3: Educational technology applications will promote students engagement and will improve student achievement by enabling students to access and analyze information, solve problems, collaborate with others, and communicate their thoughts and ideas. Effective use of learning technologies will allow students to become self-directed, self-motivated, and lifelong learners.

Critical Issues:

- Increase the number of individual school districts applying for the E-Rate program.
- Provide guidance in creating and updating technology plans.
- Support technology by providing quality technicians at the school, district, education cooperative, and state level.

Professional Development

Standards:

The International Society for Technology in Education (ISTE), National Educational Technology Standards (NETS) for administrators, teachers and students provide fundamental concepts, knowledge, skills, and attitudes for applying information technology in educational settings. This 2008-2012 technology plan includes the adoption of the ISTE and NETS standards for administrators along with the ISTE and NETS standards for teachers and students that were previously adopted. For students to acquire the technology literacy skills as outlined in the NETS-Students, they must have educated leaders who understand how to integrate those technologies into the curriculum. These student competencies drive what knowledge and skills teachers and administrators must possess. The Arkansas teacher preparation programs should ensure that their candidates meet these standards. Administrative support is also imperative to the success of the school or district technology implementation.

Current Status:

Professional development is central to the success of school reform efforts. State and local administrators must support and facilitate ongoing technology professional development for themselves, for teachers and for others who may influence student learning (school board, support staff, parents, or other school stakeholders).

In recent years, educators have become more comfortable with the variety of technologies available to them. This progress can be attributed to the technology professional development requirements and to the overall increased use of technology. However, a gap remains between the digital literacy levels of educators and students. Educators must continue to learn to use technology as a primary teaching tool in order to connect with today's digitally literate students.

Goal:

For the purpose of increasing student achievement and to prepare all learners for the challenges of the 21st Century, technology will be integrated into all aspects of teaching and learning utilizing the professional development as a mechanism of change.

Objectives:

- Ensure administrative support for the technology professional development needs and goals relating to technology integration.
- Support teacher technology initiatives by providing sufficient time and follow-up support for the mastery of new technology strategies and the integration of these strategies into practice.
- Improve the preparation of all educators, both pre-service and in-service, in the use of technology using the ISTE/NETS guidelines.
- Ensure that every educator knows how to use data to drive instruction.
- Provide practicum and mentor experiences for students and educators to successfully integrate technology into instruction.

Outcomes:

- Delivery of instruction using technology to increase diversity in instructional strategies.
- Increased student achievement.

Critical Issues:**Funding**

Typically districts spend far less on professional development than on hardware, software, and support. Ongoing financial support must be provided for the sustained delivery of quality professional development in using technology. It is recommended that districts allocate at least 25% of technology resources for technology professional development. Allocation of funds for providing opportunities, incentives, rewards, and support for educators to develop model practices using technology should also be considered.

Equity of Access to Technology

Educators must have access to technology tools required to support professional development, curriculum, instruction, and assessment. These tools include professional development opportunities and personal access to the necessary hardware and software including:

- Individual laptop computers customized for professional use
- Classroom internet connectivity
- Presentation devices such as projectors, document cameras, & interactive whiteboards
- Other technology equipment and software appropriate for specific content areas

The following resources should be made available to each Arkansas educator:
Access to professional development opportunities around the clock.

- Peer and mentor support at the building level, along with learner-centered training that encourages collaboration.
- Access to innovative, ADE approved, technology-mediated professional development opportunities at the district, cooperative, and statewide level.

Best Practices

The best forms of professional development allow educators to see actual methods used in classrooms, try out new techniques with feedback on their efforts, and observe their peers using technology. These models focus on effective strategies to integrate technology into the curriculum, as well as the teaching and learning process. For this to occur, school personnel need hands-on learning, time to experiment, easy access to the technology, and technology support.

The models of effective professional development proposed by the International Society for Technology in Education, National Council for Accreditation of Teacher Education, National Staff Development Council, and Consortium for Policy Research in Education all require that individuals be responsible for their own professional growth, and that institutions at all levels provide appropriate support.

Higher Education

The Arkansas Department of Higher Education and approved teacher education programs must collaborate effectively to ensure that programs for teacher education train new educators in the use of educational technology and its integration into instruction. Candidates in education programs should be able to demonstrate basic computer literacy and basic data examination and analysis prior to initial licensure.

The student-teaching practicum/internship experience should be a forum for established educators to share best practices in classroom instruction as well as for candidates, who may have technology skills that the established teacher lacks, to share skill sets for integrating technology into the classroom setting.

This practicum/internship in teaching should serve as an interactive forum with two-way learning between established teachers and teacher candidates. This process may also provide motivation and support for retention for novice teachers.

Faculty in teacher education programs should complete a minimum of 12 hours per year of professional development in technology use for teaching and learning and ways to integrate technology into instruction to engage the learner.

Recommendations

1. Adopt the ISTE/NETS for administrators, as has been done for teachers and students.
2. Provide educators with equitable access to appropriate technology tools including, but not limited to:
 - Individual laptop computers customized for professional use.
 - Classroom internet connectivity.
 - Presentation devices such as projectors, document cameras, & interactive whiteboards.
 - Other technology equipment and software appropriate for specific content area(s).
3. Allocate at least 25% of technology budget for professional development.
4. Apply for E-Rate reimbursements to assist with technology funding.
5. Investigate leveraging the purchase of technology tools to support technology professional development and integration at all levels.
6. Candidates in programs for teacher education demonstrate basic computer literacy before initial licensure.
7. Candidates in programs for teacher education demonstrate basic data examination and analysis skills before initial licensure.
8. Provide training in data examination and analysis to ensure that every educator knows how to use data to drive instruction.
9. Require a minimum of 12 hours of annual educational technology professional development for faculty in education preparation programs relating to the integration of technology into instruction.
10. Encourage technology professional development beyond basic education technology application, moving toward integration into instruction.
11. Require a minimum of 6 hours of annual educational technology professional development relating to the integration of technology into instruction for all certified staff.

12. Implement or support the development of Instructional Technology or Technology Integration Specialist positions at all levels.
13. Monitor the needs for professional development in technology at all levels, including staff development for local personnel responsible for technical support to educators.
14. Continue to offer quality professional development programs for educators on technology integration into teaching and learning, instructional management, and administration.
15. Investigate the process of mapping local curriculum with the use of technology-mediated resources that are aligned with the Arkansas Curriculum Frameworks to put in place a process for identifying and locating accessible digital media.
16. All persons presenting professional development should model best practices in effective use of technology for instruction to engage the learner whenever appropriate.
17. Provide state-of-the-art training facilities at all levels.
18. Provide opportunities, incentives, and support for educators to develop models of best practices using technology.
19. Integrate technology professional development opportunities into all classroom, building, and district planning efforts (including the Arkansas Comprehensive School Improvement Plan).
20. Encourage faculty and staff to engage in professional development during the school days.

State Infrastructure

Current Status

The Arkansas Department of Education (ADE) and the Department of Information Systems (DIS) have taken a leadership role in developing guidelines for technology infrastructure for new and existing facilities. These infrastructure standards will be integrated with local district educational plans as well as plans for teacher education programs. These guidelines will be based upon advances in technology and scientifically based research. The definition of technology tools extends beyond the computer workstation and includes personal digital assistants and handhelds, scientific instruments, robotic tools, online and interactive collaboration products, interactive white boards, and assistive technology tools. All of these items must be taken into consideration when utilizing monitoring and increasing the educational infrastructures capacity levels.

An essential part of effective technology use in schools is building a technology infrastructure. Building this capacity includes integrating technology into the classroom, library media center, and administrative offices. The infrastructure should enable the integration of technology into the curriculum and provide information access to the public. Initiatives should emphasize public-private partnerships and extend outside the school facilities.

Statewide Network Status

Internet Access in Schools

Since funding became available in 1997, the Arkansas Department of Education has applied for and received funding discounts that have enabled the state to provide connectivity to all public school districts. Internet service is required for K-12 connectivity to be eligible for discounts and as such Internet access has increased as the network has expanded.

Since very few schools remain without high-speed Internet access parity seems achievable. In the next three years, the state's primary focus will be improving and expanding the statewide network where critical needs exist. First, many school systems' bandwidth needs overextend the network's current capacity. Second, while some network security measures are in place, the level is by no means adequate to support the types of data transfer activities that are quickly emerging or to protect the network from potential attacks or breaches. Finally, the network must be maintained and upgraded to keep pace with technological advances and industry standards for information management.

Therefore, ADE and DIS should direct attention to the following areas:

- Providing sufficient bandwidth for each school system's growing needs and evolving Internet-based applications, such as video streaming and teleconferencing.
- Ensuring that the network reflects modern standards for transferring and securing information.
- Purchasing, installing, and using network monitoring software to measure bandwidth use, and to promote maximum use and security.

Wide Area Network

The State Backbone Network

The State Backbone Network supports connections to public (K-12) education entities across Arkansas. The backbone is the part of the communications network which carries the heaviest traffic. The backbone is also that part of a network which joins LANs or campus area networks across the state. The backbone network is deployed by the Department of Information Systems and maximizes economies of scale by aggregating data traffic from multiple public state entities in order to provide both efficient and cost effective data transport.

Aggregate Customer WAN bandwidth - Broken down by customer group:

Customer Group	Number of Connections	Aggregate Bandwidth
APSCN (K-12)	1,096	1,705 Mbps (1.7 Gbps)
State Agency	1,525	1,705 Mbps (1.7 Gbps)
Higher Ed (ARKnet)	114	357 Mbps (.4 Gbps)
Totals	2,735	3,498 Mbps (3.5 Gbps)

Network Management Applications are currently monitoring 1,937 network devices including routers, switches and other network hardware. This monitoring currently provides network level event monitoring such as bandwidth utilization, error logging, system resources, uptime and reliability. This monitoring is "on demand" and data is viewed by a DIS technician, typically in response to trouble reported by the customer.

- Core network equipment consists predominately of Cisco equipment. All core equipment is equipped with redundant power supplies connected to diverse power sources.
- Resources located in the DIS Data Center are located behind a pair of Gigabit connected firewall appliances aligned in a failover configuration. If the active firewall fails, the standby firewall becomes active with a full and current state-full connections table permitting established traffic to pass as if the original firewall was still in place. A standby firewall that does not have a full current state-full table will drop all connections at the time of failover.

State Video Network Infrastructure

The current state video network or "VNet" is comprised of six Polycom MGC bridges that are distributed across the state in four separate regions and are located in central office facilities, enterprise conference scheduling, core video network routing, and a core video network backbone. This network currently supports 505 interactive video systems (156 H.320 dedicated bandwidth sites and 349 H.323 Internet protocol sites as of September 2006). The video network runs approximately 20,000 conference hours per month. There are nearly 310 simultaneous conferences running on a day in which peak utilization of the video network occurs. The video network supports mainly educational uses in the areas of higher education and K-12. Additionally, the video network supports video conferencing for healthcare, corrections, and administrative video conferencing.

Backbone Internet Connectivity

The Statewide Network has been engineered with three geographically diverse Internet "Points of Presence" (PoPs) in Little Rock, Fayetteville and Pine Bluff. These three PoPs provide Internet redundancy and static load balancing. In the event that any of these connections to an Internet Service Provider fails, Internet traffic is re-routed to one of the other PoPs.

Internet Content Filtering

DIS provides Core Based Internet Content Filtering for K-12 schools/districts that choose to use this service. This service provides Internet or Web filtering to prevent accessing Web pages or other Internet services based on 67 different categories. The manufacturer evaluates Web sites and places them in the appropriate categories. If a customer wishes to deviate from the default configuration they can accept local control which permits them to select the filter categories they wish to filter. The customer can manipulate their filter environment as their filter requirements change. Local control also permits the

customer to configure a local over-ride account permitting temporary override of the filter.

Network Disaster Recovery

In the event of a disaster that renders the Multi-Agency Complex "out of service" customer connections that are terminated in central office routing, N.W. Arkansas, and Pine Bluff hardware will continue to function. Resources on the DIS Data Center will no longer be accessible to these customers. Internet activity will failover to the N.W. Arkansas Internet connection for central office routing customers and will remain out of Pine Bluff for the Pine Bluff connected customers.

In addition to the above described infrastructure, the Statewide Network has provided a connection to an off-site, out of state disaster recovery service provider. This is an OC3 connection and is connected to the Central Office Routing infrastructure. In the event that the building is destroyed, resources will be restored at the off-site disaster recovery facility and network traffic will re-route to this location.

Goals:

- Develop a Robust and Reliable Security Infrastructure.
- Advance information and educational technology in support of learning and discovery.
- Support the development of simplified business processes and services for students, faculty, and staff.
- Enrich and extend the telecommunications infrastructure.
- Coordinate and promote staff technical training.

Critical Issues:

- Increased bandwidth and cost.
- Funding for state infrastructure and management.
- Network security.

Recommendations

1. Bandwidth capacity terminating in K-12 institutions in Arkansas should be doubled over the next two years.
2. School districts are encouraged to implement campus area networks.
3. School districts will be required to apply for E-Rate funding or they will not receive any technology funding from the Arkansas Department of Education.
4. Schools and/or districts will be responsible for any refund due to non educational E-Rate usage in accordance with E-Rate guidelines.
5. Provide scalable, robust, and reliable academic systems infrastructure.

Outcomes:

1. Increased security of the network.
2. Increased IT planning and deployment of new tools.
3. Increased stability and manageability of the state technology infrastructure.
4. Creation of IT Tools which are scalable and reliable for academic systems.
5. Utilization of dynamic Web applications.
6. Ability to do independent research on specific infrastructure technologies.

State Technology Funding

Current Status

Arkansas has the opportunity to drive change through maximizing the potential of educational technology which can be achieved by developing technology solutions that are scalable, flexible, reliable, and have the ability to cost-effectively individualize education for all students. Arkansas has successfully leveraged Title II D funds to develop statewide programs that improve student achievement, increase levels of access, support professional development, and enhance data systems.

It is critical that funding for technology in schools remains a dedicated and targeted source to ensure adequate and equitable access for all students. Students must be able to use technology to help them learn content and skills – so that they know how to think critically, solve problems, use information, communicate, innovate, and collaborate. Without appropriate and adequate technology in schools, students will lack opportunities to learn 21st Century Skills that will help them succeed in life and work.

Arkansas has made educational technology a funding priority. The Arkansas Department of Education provides direct state funding for the state K-12 educational technology infrastructure, statewide technology projects, access to the Internet, and state data and video networks. E-Rate funding is used to subsidize state funds to assist schools with purchasing broadband services, supporting equipment, technical assistance, and distance education resources.

Capital improvement funds, E-Rate funds, federal funds, dedicating local school mileage to technology, and redistributing certain existing funds are strategies that are being used by Arkansas school districts for funding technology programs.

When a state technology grant program is established, it provides 1) entitlement funds to districts, based on a distribution formula, and 2) discretionary grants for demonstration projects that applies technology solutions to real, documented instructional needs. Two types of discretionary grant programs were created: one to promote curriculum and instruction via the development of technology networks and professional development; the other to develop capacity for two-way interactive distance learning for the delivery of high school courses.

Technical Support

Technical support for school districts is crucial to creating and sustaining technology initiatives. An effective technology program relies on the understanding that the technology alone cannot advance student learning if it is not used and maintained properly. Arkansas has chosen to use a comprehensive technical support plan that includes funding technology coordinators to install and repair equipment and distance learning coordinators to assist teachers and students with distance learning and interactive videoconferencing. Each education service cooperative currently has a state funded technology coordinator and a distance learning coordinator to provide key support across the state.

Professional Development

The Arkansas Department of Education realizes that teachers are a key element to success in a child's education. Therefore, it is imperative that teachers receive professional staff development in the area of technology to be able to model and teach their students how to use these valuable tools. The Department has funded online professional development through the Internet Delivered Education for Arkansas Schools (IDEAS) portal. This online professional development resource for Arkansas educators was designed to enhance teachers' content knowledge and instructional skills.

Additional professional development is funded through grants to the education service centers and through the distance learning video network.

Online Resources

Schools need additional resources to fully enhance the educational process. The state currently funds and provides access to the following online technology projects:

Arkansas Traveler Project- a portal of electronic databases including full text journals, newspapers, periodicals, instructional and professional resources, and information about authors that is available to all schools, libraries, and Arkansas teachers.

United Streaming- educational video streaming of curriculum resources.

Triand-electronic transcript transfer application.

COGNOS- school data financial reports application.

Goals:

Goal 1: Adequate funding will be provided to assure that all public school students and personnel will have access to and develop proficiency in the use of technology in the teaching and learning process.

Objective 1: All students and staff will have access to a modern and effective technology infrastructure which enhances quality learning.

Goal 2: Arkansas will develop innovative methods of funding to convert and sustain teaching and learning through educational technology, and build local, regional, and statewide capacity.

Objective 1: Provide appropriate new and flexible models of budgeting for technology.

Objective 2: Continuously assess and evaluate technology investments and implementations.

Critical Issues:

- Maintain and upgrade the state technology network.
- Schools that do not apply for E-Rate funding should not receive any technology funding or grants from the Arkansas Department of Education.
- Require schools and/or districts to be responsible for any non educational E-Rate usage.

Recommendations

1. Fund one local technology integration specialist in each Education Service Cooperative.
2. Require schools or districts to hire a technology specialist in each Local Education Agency for each 1100 students.
3. Apply for E-Rate reimbursements to assist with technology funding.
4. Schools that do not apply for E-Rate funding shall not receive technology funding or grants from the Arkansas Department of Education.

5. Require schools and or districts to be responsible for any non educational E-Rate usage.
6. Coordinate funding processes to maximize benefits to schools in the acquisition, maintenance, and use of technology.
7. Leverage discretionary funds to foster innovation in teaching, learning, and assessment in traditional and electronic learning environments.
8. Solicit federal funding and private grant foundations for innovative educational technology projects.
9. Coordinate funding for maintenance and upgrades for the K-12 state infrastructure and networks.
10. Develop, promote, and provide technical assistance for administrative applications for technology including: interactive reports, online standardized testing, e-grants program, student information systems, online data collections, and Web-enabled consolidated application for funding.

Outcomes:

1. Acquisition of additional educational technology funding.
2. Hiring and training highly qualified technical support staff.
3. Providing a robust network that offers a wide range of Internet or Web based applications.
4. Expanding managed network services for education and research, and providing frequent conferences and training opportunities.
5. Developing a robust optical infrastructure that is capable of supporting advanced research and emerging education initiatives.

Evaluation

Evaluation of the State Technology Plan will include the gathering of key data that is sent to the Department of Information Systems and the Arkansas Department of Education. Data gathered will provide technology leaders with information on the technology needs and support necessary for educators to enhance their technology effectiveness in the classroom and achieve increased student performance. Data, in conjunction with the evaluation plan, will produce specific information about the increase and effectiveness in the application of technology throughout the state.

Key data elements will be evaluated and disseminated so that schools, education service cooperatives, and higher education institutions will be aware of various goals, successes and limitations of technology initiatives. The Research and Technology Section of the Arkansas Department of Education will analyze technology data to determine funding and resource development priorities for the state. Evaluation of the Arkansas State Technology Plan will be ongoing and comprehensive.

Summary

Imagine Arkansas students being responsible, caring, educated citizens that value innovation and are committed to consistent growth and improvement through the use of technology. The 2008-2012 Arkansas State Technology Plan has been designed to serve as a framework to obtain this vision. The plan is also designed to meet requirements for federal funding, promote the power of digital technologies, and assure that the students are prepared to be competent in the skills of the 21st Century.

APPENDICES

National Educational Technology Standards for Students: The Next Generation

1. Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:

- a. apply existing knowledge to generate new ideas, products, or processes.
- b. create original works as a means of personal or group expression.
- c. use models and simulations to explore complex systems and issues.
- d. identify trends and forecast possibilities.

2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

- o interact, collaborate, and publish with peers, experts or others employing a variety of digital environments and media.
- o communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- o develop cultural understanding and global awareness by engaging with learners of other cultures.
- o contribute to project teams to produce original works or solve problems.

3. Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information.

Students:

- o plan strategies to guide inquiry, locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media; evaluate and select information sources and digital tools based on the appropriateness to specific tasks; process data and report results.

4. Critical Thinking, Problem-Solving & Decision-Making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources.

Students:

- o identify and define authentic problems and significant questions for investigation.
- o plan and manage activities to develop a solution or complete a project.
- o collect and analyze data to identify solutions and/or make informed decisions.
- o use multiple processes and diverse perspectives to explore alternative solutions.

5. Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

Students:

- advocate and practice safe, legal, and responsible use of information and technology.
- exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
- demonstrate personal responsibility for lifelong learning.
- exhibit leadership for digital citizenship.

6. Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems and operations.

Students:

- understand and use technology systems.
- select and use applications effectively and productively.
- troubleshoot systems and applications.
- transfer current knowledge to learning of new technologies.

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National Educational Technology Standards for Teachers

I. TECHNOLOGY OPERATIONS AND CONCEPTS

Teachers demonstrate a sound understanding of technology operations and concepts. Teachers:

- A. demonstrate introductory knowledge, skills, and understanding of concepts related to technology (as described in the ISTE *National Educational Technology Standards for Students*).
- B. demonstrate continual growth in technology knowledge and skills to stay abreast of current and emerging technologies.

II. PLANNING AND DESIGNING LEARNING ENVIRONMENTS AND EXPERIENCES

Teachers plan and design effective learning environments and experiences supported by technology. Teachers:

- A. design developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners.
- B. apply current research on teaching and learning with technology when planning learning environments and experiences.
- C. identify and locate technology resources and evaluate them for accuracy and suitability.
- D. plan for the management of technology resources within the context of learning activities.
- E. plan strategies to manage student learning in a technology-enhanced environment.

III. TEACHING, LEARNING, AND THE CURRICULUM

Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning.

Teachers:

- A. facilitate technology-enhanced experiences that address content standards and student technology standards.
- B. use technology to support learner-centered strategies that address the diverse needs of students.
- C. apply technology to develop students' higher order skills and creativity.
- D. manage student learning activities in a technology-enhanced environment.

IV. ASSESSMENT AND EVALUATION

Teachers apply technology to facilitate a variety of effective assessment and evaluation strategies.

Teachers:

- A. apply technology in assessing student learning of subject matter using a variety of assessment techniques.
- B. use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning.
- C. apply multiple methods of evaluation to determine students' appropriate use of technology resources for learning, communication, and productivity.

V. PRODUCTIVITY AND PROFESSIONAL PRACTICE

Teachers use technology to enhance their productivity and professional practice. Teachers:

- A. use technology resources to engage in ongoing professional development and lifelong learning.
- B. continually evaluate and reflect on professional practice to make informed decisions regarding the use of technology in support of student learning.
- C. apply technology to increase productivity.
- D. use technology to communicate and collaborate with peers, parents, and the larger community in order to nurture student learning.

VI. SOCIAL, ETHICAL, LEGAL, AND HUMAN ISSUES

Teachers understand the social, ethical, legal, and human issues surrounding the use of technology in PK–12 schools and apply that understanding in practice. Teachers:

- A. model and teach legal and ethical practice related to technology use.
- B. apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.
- C. identify and use technology resources that affirm diversity.
- D. promote safe and healthy use of technology resources.
- E. facilitate equitable access to technology resources for all students.

All classroom teachers should be prepared to meet the following standards and performance indicators.

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National Educational Technology Standards for Administrators

Profiles for Technology-Literate Administrators

PRINCIPAL PROFILE

Principals who effectively lead integration of technology typically perform the following tasks. Effective principals:

I. Leadership and Vision

1. participate in an inclusive district process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.
2. develop a collaborative, technology-rich school improvement plan, grounded in research and aligned with the district strategic plan.
3. promote highly effective practices in technology integration among faculty and other staff.

II. Learning and Teaching

1. assist teachers in using technology to access, analyze, and interpret student's performance data, and in using results to appropriately design, assess, and modify student's instruction.
2. collaboratively design, implement, support, and participate in professional development for all instructional staff that institutionalizes effective integration of technology for improved student's learning.

III. Productivity and Professional Practice

1. use current technology-based management systems to access and maintain personnel and student records.
2. use a variety of media and formats, including telecommunications and the school website, to communicate, interact, and collaborate with peers, experts, and other education stakeholders.

IV. Support, Management, and Operations

1. provide campus-wide staff development for sharing work and resources across commonly used formats and platforms.
2. allocate campus discretionary funds and other resources to advance implementation of the technology plan.
3. advocate for adequate, timely, and high-quality technology support services.

V. Assessment and Evaluation

1. promote and model the use of technology to access, analyze, and interpret campus data to focus efforts for improving student learning and productivity.
2. implement evaluation procedures for teachers that assess individual growth toward established technology standards and guide professional development planning.
3. include effectiveness of technology use in the learning and teaching process as one criteria in assessing performance of instructional staff.

VI. Social, Legal, and Ethical Issues

1. secure and allocate technology resources to enable teachers to better meet the needs of all learners on campus.
2. adhere to and enforce among staff and students the districts acceptable use policy and other policies and procedures related to security, copyright, and technology use.
3. participate in the development of facility plans that support and focus on health and environmentally safe practices related to the use of technology.

DISTRICT PROGRAM DIRECTOR PROFILE

ISTE National Educational Technology Standards for Administrators

http://cnets.iste.org/administrators/a_profiles.html

District program directors who effectively lead integration of technology typically perform the following tasks. Effective program directors:

I. Leadership and Vision

1. assure that program technology initiatives are aligned with the district technology vision.
2. represent program interests in the development and systematic review of a comprehensive district technology plan.
3. advocate for program use of promising practices with technology to achieve program goals.

II. Learning and Teaching

1. participate in developing and providing electronic resources that support improved learning for program participants.
2. provide rich and effective staff development opportunities and ongoing support that promote use of technology to enhance program initiatives and activities.
3. ensure that program curricula and services embrace changes brought about by the proliferation of technology within society.

III. Productivity and Professional Practice

1. use technology and connectivity to share promising strategies, interesting case studies, and student and faculty learning opportunities that support program improvement.
2. model, for program staff, effective uses of technology for professional productivity such as in presentations, record keeping, data analysis, research, and communications.
3. use online collaboration to build and participate in collaborative learning communities with directors of similar programs in other districts.

IV. Support, Management, and Operations

1. implement technology initiatives that provide instructional and technical support as defined in the district technology plan.
2. determine financial needs of the program, develop budgets, and set timelines to realize program technology targets.

V. Assessment and Evaluation

1. continuously monitor and analyze performance data to guide the design and improvement of program initiatives and activities.
2. employ multiple measures and flexible assessment strategies to determine staff technology proficiency within the program and to guide staff development efforts.

VI. Social, Legal, and Ethical Issues

1. involve program participants, clients, and staff in dealing with issues related to equity of access and equity of technology-rich opportunities.
2. educate program personnel about technology-related health, safety, legal, and ethical issues, and hold them accountable for decisions and behaviors related to those.
3. inform district and campus leadership of program-specific issues related to privacy, confidentiality, and reporting of information that might impact technology system and policy requirements.

SUPERINTENDENT PROFILE

Superintendents who effectively lead the integration of technology typically perform the following tasks. Effective superintendents:

I. Leadership and Vision

1. assure that the vision for use of technology is congruent with the overall district vision.

ISTE National Educational Technology Standards for Administrators

http://cnets.iste.org/administrators/a_profiles.html

2. engage representatives from all stakeholder groups in the development, implementation, and ongoing assessment of a district technology plan consistent with the district's improvement plan.
3. advocate to the school community, the media, and the community at large for effective technology use in schools for improved student learning and efficiency of operations.

II. Learning and Teaching

1. provide equitable access for students and staff to technologies that facilitate productivity and enhance learning.
2. communicate expectations consistently for the use of technology to increase student achievement.
3. ensure that budget priorities reflect a focus on technology and its relationships to enhanced learning and teaching.

III. Productivity and Professional Practice

1. establish a culture that encourages responsible risk-taking with technology while requiring accountability for results.
2. maintain an emphasis on technology fluency among staff across the district and provide staff development opportunities to support high expectations.
3. use current information tools and systems for communication, management of schedules and resources, performance assessment, and professional learning.

IV. Support, Management, and Operations

1. provide adequate staffing and other resources to support technology infrastructure and integration across the district.
2. ensure, through collaboration with district and campus leadership, alignment of technology efforts with the overall district improvement efforts in instructional management and district operations.

V. Assessment and Evaluation

1. engage administrators in using district-wide and disaggregated data to identify improvement targets at the campus and program levels.
2. establish evaluation procedures for administrators that assess demonstrated growth toward achieving technology standards for school administrators.

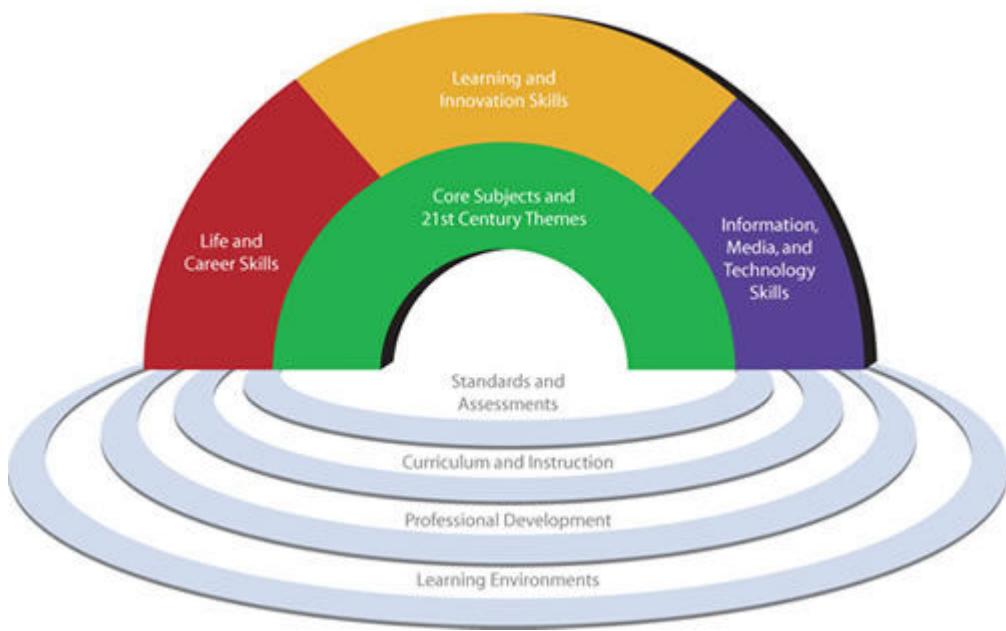
VI. Social, Legal, and Ethical Issues

1. ensure that every student in the district engages in technology-rich learning experiences.
2. recommend policies and procedures that protect the security and integrity of the district infrastructure and the data resident on it.
3. develop policies and procedures that protect the rights and confidentiality of students and staff.

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21st Century Skills Standards

A Partnership for 21st Century Skills



21st Century Standards should:

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21ST CENTURY STUDENT OUTCOMES

The elements described in this section as "21st century student outcomes" (represented by the rainbow) are the skills, knowledge and expertise students should master to succeed in work and life in the 21st Century.

Core Subjects and 21st Century Themes

Mastery of **core subjects and 21st Century themes** is essential for students in the 21st Century. Core subjects include English, reading or language arts, world languages, arts, mathematics, economics, science, geography, history, government and civics.

We believe schools must move beyond a focus on basic competency in core subjects to promoting understanding of academic content at much higher levels by weaving **21st Century interdisciplinary themes** into core subjects:

- **Global Awareness**
- **Financial, Economic, Business and Entrepreneurial Literacy**
- **Civic Literacy**
- **Health Literacy**

Learning and Innovation Skills

Learning and innovation skills are what separate students who are prepared for increasingly complex life and work environments in the 21st Century and those who are not. They include:

- **Creativity and Innovation**
- **Critical Thinking and Problem Solving**
- **Communication and Collaboration**

Information, Media and Technology Skills

People in the 21st Century live in a technology and media-driven environment, marked by access to an abundance of information, rapid changes in technology tools and the ability to collaborate and make individual contributions on an unprecedented scale. To be effective in the 21st century, citizens and workers must be able to exhibit a range of functional and critical thinking skills, such as:

- **Information Literacy**
- **Media Literacy**
- **ICT (Information, Communications and Technology) Literacy**

Life and Career Skills

Today's life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills, such as:

- **Flexibility and Adaptability**
- **Initiative and Self-Direction**
- **Social and Cross-Cultural Skills**
- **Productivity and Accountability**
- **Leadership and Responsibility**

21st CENTURY SUPPORT SYSTEMS

Developing a comprehensive framework for 21st Century learning requires more than identifying specific skills, content knowledge, expertise and literacy. An innovative support system must be created to help students master the multi-dimensional abilities required of them in the 21st Century. The Partnership has identified five critical support systems that ensure student mastery of 21st Century skills:

- **21st Century Standards**
- **Assessment of 21st Century Skills**
- **21st Century Curriculum and Instruction**
- **21st Century Professional Development**
- **21st Century Learning Environments**
- **Focus on 21st Century skills and content.**

Students need to know *how* as well as *what* in order to participate fully in the modern world.

- **Give students the context of the topics they are studying.**

Students want to know *why* a given topic is relevant, as well as understand *how* to inscribe the topic in an overarching personal construct.

- **Promote deeper engagement with core subjects through analysis and synthesis, not merely descriptive or memorized facts.**

In a world of facts at our fingertips, depth of knowledge matters more than breadth.

- **Build understanding across disciplinary categories through 21st Century themes.**

Meaningful problems are usually complex and boundary-spanning.

- **Engage students with the real world data, tools, and experts they will encounter in college, on the job, and in life.**

Students learn best when actively engaged in solving meaningful problems.

- **Go beyond content knowledge to identify other 21st Century educational support systems.**

Coherent curricula, powerful professional development opportunities, and engaging learning environments are essential to a 21st Century education system.

- **Allow for multiple measures of mastery.**

The richness of 21st Century learning requires a matching range of assessments, from standardized tests to technology-enhanced, classroom, and performance-based assessments.

- **Use accountability as an indicator of progress, rather than a system of sanctions, to guide systemic improvement of students, teachers, and schools.**

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Educational Technology: Are School Administrators Ready For It?
<http://www.sreb.org/programs/EdTech/pubs/ReadyForIt/EdTech-ReadyForIt.pdf>

Professional Development Courses and Programs
http://www.sreb.org/programs/EdTech/pubs/PDF/04T04-Standards_Online_Prof_Dev.pdf

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Online Resources

www.hprtec.org

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Technology Glossary

A

Acceptable Use Policy (AUP): This is a policy set up by the network administrator or other school leaders in conjunction with their technology needs and safety concerns. This policy restricts the manner in which a network may be used, and helps provide guidelines for teachers using technology in the classroom.

Alias: A file that points to another item, such as a program, document, folder, or disk. When an alias is opened, the original item that the alias points to is opened. This helps in the organizing and accessing of files. Alias is purely a Mac term. The equivalent term for Windows-based computers is a shortcut.

Applet: A program designed to be executed from within another application.

Application: Computer software; also called a program. There are many types of software that fit into the category of application. Application software is distinct from other forms of software, such as operating system and utility software.

ASCII (American Standard Code for Information Interchange): This international standard contains 128 codes that correspond to all upper and lower-case Latin characters, numbers, and punctuation marks. Each code is represented by a seven-digit binary number: 0000000 through 1111111.

Assistive Technology: Any item, piece of equipment or product system, whether acquired commercially, off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.

Attachment: An attachment, or attached file, is a file sent over the Internet along with an email message. Attachments are the quickest way to share documents with people outside your organization. The advantage of sending an attachment over sending a fax is that the receiver can view, edit or print the attachment as s/he wishes. When sending an attachment to someone, make sure you send it in a format that they can read. For instance, if you send a Word for Macintosh document to someone who has WordPerfect on a PC, they may not be able to open the file, or it may be garbled.

Authentication: This security measure is the process of determining whether someone is who they say they are. On campus, a common method of authentication is the login ID and Kerberos password.

Avatar: A graphical icon that represents a real person in a cyberspace system. In e-learning, avatars usually represent the learners. The term comes from a Sanskrit word meaning an incarnation in human form.

B

Bandwidth: The capacity of a network or data connection to transmit data.

Backup: Backup is the process of preserving copies of files on a different drive, directory, or media (often floppy disks or tape) to protect against the destruction or loss of the original files in the event of hardware or system failure. Two backups are often recommended: one onsite and another offsite.

Banner: a banner is either a graphic image that announces the name or identity of a site (and often is spread across the width of the Web page) or is an advertising image. Advertisers sometimes count banner "views," or the number of times a banner graphic image was downloaded over a period of time.

BCC (Blind Courtesy Copy or Blind Carbon Copy): A way to send an e-mail message to more than one recipient, without the parties knowing that an identical message was sent to others. Using the BCC is a good way to avoid the long list of recipients that your correspondents usually have to wade through in the header of a mass-mailing.

Blog/Blogging: This term is derived from *Web log* and is an increasingly popular type of Web site. Most take the form of journal entries and allow readers to post comments.

Bluetooth: A short-range radio technology aimed at simplifying communications among internet devices and between devices and the Internet.

Bookmark: A web page link stored in a browser for quick and easy retrieval.

Boolean Operators: Most search engines allow you to limit your search or make it more specific by using words like "And," "Or," and "Not." These words are known as Boolean operators because of their origin as terms in logic. For example, if you do a search on "Nonprofits AND Technology," TechSoup.org should show up in the results.

Bridge: In telecommunications networks, a bridge is a product that connects a local area network (LAN) to another local area network that uses the same

protocol (for example, Ethernet or Token Ring). You can envision a bridge as being a device that decides whether a message from you to someone else is going to the local area network in your building or to someone on the local area network in the building across the street. A bridge examines each message on a LAN, "passing" those known to be within the same LAN, and forwarding those known to be on the other interconnected LAN (or LANs).

Broadband: A type of data transmission in which a single medium (wire) can carry several channels at once. Cable TV, for example, uses broadband transmission. Broadband technology can transmit data, audio, and video all at once over long distances.

Broadcast: To simultaneously send the same message to multiple recipients. Broadcasting is a useful feature in e-mail systems.

Browser: A software application used to locate and display web pages.

BTW (By The Way): An acronym often used in e-mail messages and chat sessions to mean: "by the way."

C

CC (Courtesy Copy): A way to send an e-mail message to a person other than the main recipient or recipients. The CC'ed party can see that they are not the main recipient of the letter.

Chat: Real-time text-based communication in a virtual environment. Chat can be used in e-learning for student questions, instructor feedback, or even group discussion. These Web sites or online services facilitate electronic discussions by quickly posting the comments and responses of multiple users.

CGI (Common Gateway Interface): The standard way that a web server can access an application program at the request of a web user. For example, if a web user fills out an interactive form on a web page, the web server would use a CGI script to communicate with a database that would process the information from the form. CGI scripts are used to query a database, generate a dynamic HTML page, or send an email message based on the user's input into a form.

Circumventor Sites: These parallel Web sites allow children to get around some filtering software and access sites that have been blocked.

Class Management Tools: Applications or modules that can be used to facilitate the administration of a class for instructional staff, enhance collaboration and communication among students and staff, or manage class materials by staff and students.

Codec: Short for compressor/decompressor, a codec is any technology for compressing and decompressing data. Codecs can be implemented in software, hardware, or a combination of both.

Collaboration Technology: Software, platforms, or services that enable people at different locations to communicate and work with each other in a secure, self-contained environment. May include capabilities for document management, application sharing, presentation development and delivery, white-boarding, chat, and more.

Compressed Video: Video signals compressed in order to reduce the bandwidth needed for transmission. Some information is sacrificed in the process, which may result in lower quality.

Cookie: A message given by a web server to a web browser, which stores the message in a text file. The message is then sent back to the server each time the browser requests a page from the server. The main purpose of cookies is to identify users and possibly prepare customized Web pages for them. Cookies can be disabled in the browser.

Course Management System (CMS)(aka Learning Management System — LMS): Software that automates the administration of a class web site. These often include modules for online class discussions, grade books, homework turn-in and pickup, class calendars, and tools to make it easy to upload documents and link to electronic course reserves.

Courseware: Software designed to be used in an educational program.

CSS (Cascading Style Sheets): An HTML feature that enables web page developers and users to specify the way a web page appears when displayed in a browser, by applying a number of different style sheets to the page. Each style sheet controls a different design element or set of design elements.

Cyberbullies/Cyberbullying: This refers to any threats by one student toward another, typically through e-mails or on Web sites (e.g., blogs, social networking sites).

Cybercrime: This refers to any Internet-related illegal activity.

Cybersecurity: This refers to any technique, software, etc., used to protect computers and prevent online crime.

Cyberstalking: This refers to a number of methods individuals use to track, lure, or harass another person online.

Cyberspace: The nebulous "place" where humans interact over computer networks; term coined by William Gibson in Neuromancer.

D

Data: Numbers, characters, images, or other method of recording, in a form which can be assessed by a human or (especially) input into a computer, stored and processed there, or transmitted on some digital channel.

Data Warehousing: A generic term for a system for storing, retrieving and managing large amounts of any type of data. Data warehouse software often includes sophisticated compression and hashing techniques for fast searches, as well as advanced filtering.

Device: Any part of a computer other than the CPU or working memory, i.e. disks, keyboards, monitors, mice, printers, scanners, tape drives, microphones, speakers, cameras, to list just the less exotic ones.

Digital: A digital signal is the faster, more secure successor to analog technology.

Digital Signature: A digital signature (not to be confused with a digital certificate) is an electronic rather than a written signature that can be used by someone to authenticate the identity of the sender of a message or of the signer of a document. It can also be used to ensure that the original content of the message or document that has been conveyed is unchanged.

Domain Name: A set of network addresses; a set of network resources (applications, printers, and so forth) for a group of users. The user need only to log in to the domain to gain access to the resources, which may be located on a number of different servers in the network.

Download: To save a file onto your computer from another source, like the Internet. People often download files, such as free-ware, share-ware, for installations, and sounds, movie clips, text files, or news streams onto their computer for viewing or listening.

DNS (Domain Name System): This is a service that stores, translates, and retrieves the numerical address equivalents of familiar host names that you use everyday (such as the "www.4teachers.org" in <http://www.4teachers.org>). Each host name corresponds to a numerical address required by standard Internet protocol that the DNS retrieves in order to allow you to remember addresses with names, not numbers. DNS entries are housed on numerous servers worldwide.

DHCP (Dynamic Host Configuration Protocol): A protocol for assigning dynamic IP addresses to devices on a network. In some systems, the device's IP address can even change while it is still connected.

DHTML (Dynamic HTML): Is the combination of HTML, style sheets and scripts that allows documents to be animated. Dynamic HTML allows a web page to change after it's loaded into the browser --there doesn't have to be any communication with the web server for an update.

Digital Audio: Refers to the reproduction and transmission of sound stored in a digital format. This includes CDs as well as any sound files stored on a computer. In contrast, the telephone system (but not ISDN) is based on an analog representation of sound.

Digital Editing: Editing a portion of a movie by digitizing one or more frames and altering them electronically or combining them with other digitized images, and then printing the modified frame.

Distance Learning: The technology and educational process used to provide instruction when the student and primary instructor are not physically present at the same time and/or place.

DSL (Digital Subscriber Line): DSL is a technology for bringing high-bandwidth information to homes and small businesses over ordinary copper telephone lines. Assuming your home or small business is close enough to a telephone company central office that offers DSL service, you may be able to receive data at rates up to 6.1 megabits (millions of bits) per second (of a theoretical 8.448 megabits per second), enabling continuous transmission of motion video, audio, and even 3-D effects. More typically, individual connections will provide from 1.544 Mbps to 512 Kbps downstream and about 128 Kbps upstream.

DVB (Digital Video Broadcasting): Harmonized digital TV that covers all media (satellite, cable and terrestrial). It supports Internet services at speeds up to 6 Mbps and can be used on mobile devices.

DVD (Digital Video Disc): A special type of disc with greater data storage capacity and access rate. Commonly used as a medium for movies and other video data, but can hold any kind of data.

DVI (Digital Visual Interface): A digital interface standard created by the Digital Display Working Group (DDWG) to convert analog signals into digital signals to accommodate both analog and digital monitors.

E

EDI (Electronic Data Interchange): A set of widely-used, standardized format for the computer-to computer exchange of business documents.

Ethernet: A common method of networking computers in a Local Area Network (LAN) . Ethernet can handle from 10,000,000-100,000,000 bits per second (or 10-100 megabits-per-second) and can be used with almost any kind of computer.

E-learning (Electronic learning): Term covering a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audio- and videotape, satellite broadcast, interactive TV, CD-ROM, and more.

E-mail Attachment: A virtual package sent via email, usually a Word document from a colleague, or a photo from a friend.

E-mail (Electronic mail): An electronic document (usually a message) sent to a person or group on the Internet. When used as a verb, "email" refers to the act of sending such a document over the Internet.

E-mail List: A form of one-to-many communication using e-mail; a software program for automating mailing lists and discussion groups on a computer network.

Encoding: The process of compressing a media file for a specific purpose, such as streaming on the web. One can encode a file that is in analog form (such as a VHS tape) or one that is digital (such as the signal on a Mini-DV tape).

Encryption: Encoding information using some specific algorithm in order to hide it. The original information can not be retrieved without using a matching decryption algorithm.

End User: The person for whom a particular technology is designed; the individual who uses the technology for its designated purpose. In e-learning, the end user is usually the student.

External Drive: An external drive is a hard drive or a floppy disk drive that is not built into your computer, but which is housed in a separate box that you connect to your computer.

E

FAQ (Frequently Asked Questions): An informational list, in question and answer format, of common inquiries from users about a topic or application and standard responses.

File Server: A computer on a network with the primary task of storing files that can be shared by network users.

Filter/Filtering: A filter is a feature of many email programs, including Eudora and Outlook. Filters sort through your emails according to criteria that you specify, and perform the actions that you specify.

Firewall: A combination hardware and software buffer that many companies or organizations have in place between their internal networks and the Internet. A firewall allows only specific kinds of messages from the Internet to flow in and out of the internal network. This protects the internal network from intruders or hackers who might try to use the Internet to break into those systems.

FireWire: Apple Computer's trademarked name for its high-speed serial bus supporting the IEEE 1394 data transfer standard. FireWire enables the connection of up to 63 devices and transfers data at a speed of up to 400 mbps.

Flash Drive: A USB keychain (also known as a jump drive, a USB drive, flash drive, or keychain drive) is a plug-and-play portable storage device that functions similarly to a floppy disk, Zip drive disk, or CD. Flash drives can be used to transfer files from one computer system to another, or for short-term backup of data.

Flame: A flame is a message (usually sent via e-mail) that is strongly worded (or even profane) and disagrees with or insults the recipient.

FTP (File Transfer Protocol): The protocol used on the Internet for exchanging files. FTP is a specific way to connect to another Internet site to retrieve and send files. FTP was developed in the early days of the Internet to copy files from computer to computer. With the advent of the World Wide Web, and web browser software, you no longer need to know arcane FTP commands to copy to and from other computers.

G

GB (Gigabyte): A billion binary pulses; commonly used for measuring the amount of data that is transferred in a second between two telecommunication points.

GIF (Graphics Interchange Format): Pronounced jiff or giff (hard g), a file format commonly used for images on the Web. GIFs are especially suitable for images composed of relatively few colors, such as logos or vector graphics.

GIS (Geographic Information Systems): Computer modeling software that uses satellite imagery to depict landscapes and terrains. GIS uses lines, shading or symbols to show this information on computer-generated maps, and is used by planners, conservationists, and nonprofit organizations.

GUI (Graphical User Interface): A computer interface using icons or pictures.

H

Hardware: The physical, touchable, material parts of a computer or other system. The term is used to distinguish these fixed parts of a system from the more changeable software or data components which it executes, stores, or carries.

History: This is a tracking feature of Internet browsers that shows all the recent Web sites visited.

Home Page: The main page of a web site. Typically, the home page serves as an index or table of contents to other documents stored at the site.

Host: A computer system that is accessed by a user working at a remote location. Typically, the term is used when there are two computer systems connected by modems and telephone lines. The system that contains the data is called the host, while the computer at which the user sits is called the remote terminal.

HTML (HyperText Markup Language): The programming language used to create documents for display on the World Wide Web.

HTTP (HyperText Transfer Protocol): The set of rules and standards that govern how information is transmitted on the World Wide Web.

HTTP Streaming: A form of streaming (popularized by QuickTime) in which media files begin to play before they are downloaded entirely. This means that they can be sent via HTTP and don't require specialized server software such as RealMedia files do.

Hub: A hub is a device that computers on a local area network connect to in order to exchange information. Each computer is connected to a different port on the hub. If one computer sends out an electronic message to the network, the hub will broadcast it to all the other computers.

Hyperlink: A highlighted word (or graphic) within a hypertext document (Web page). When you click a hyperlink, it will take you to another place within the same page, or to another page.

|

Identity Theft: In this crime, someone obtains the vital information (e.g., credit card, Social Security, bank account numbers) of another person, usually to steal money. E-mail scams, spyware, and viruses are among the most typical methods for stealing someone's identity.

Infrastructure: A network of interconnected computers and communications systems. Possible elements include wiring, fiber optics, radio, video and/or cellular broadcast signals.

IP Internet Protocol: The method by which data is sent from one computer to another on the Internet.

Instant Message/Messaging: Known by the acronym *IM*, this is a variation of chat rooms that allows users to communicate through text messages.

Intellectual Property: An idea, invention, formula, literary work, presentation, or other knowledge asset owned by an organization or individual. Intellectual property can be protected by patents, trademarks, service marks, and/or copyrights.

Internet: A set of interconnected networks which allow computers in different locations to exchange information. The Internet includes services such as the World Wide Web, electronic mail, file transfer (FTP), chat and remote access to networks and computers.

Intranet: An intranet is basically an internal Internet designed to be used within the confines of a company, university, or organization. What distinguishes an intranet from the freely accessible Internet is that an intranet is private.

ISDN (Integrated Services Digital Network): Like a cross between a digital connection and a dial up, ISDN was designed to be a replacement for the public telephone network. ISDN connections consist of ISDN modems that dial-up another ISDN modem across ordinary telephone lines. ISDN can attain a data transmission rate of up to 128Kbps.

ISP (Internet Service Provider): A hosting company that provides end user access to such Internet services as e-mail, the World Wide Web, FTP, newsgroups, and so forth.

J

Java: An object-oriented programming language, developed by Sun Microsystems, that is platform independent (i.e., works on Windows, Mac OS, Linux). Java is often used to write "java applets," which are small applications that can be embedded into web pages, giving the pages sophisticated functionality.

JavaScript: A fairly simple programming language compared to languages like Java and C++ developed by Netscape that allows web authors to give functionality to web pages. Common functions created with JavaScript are image rollovers (an image that changes when you scroll your mouse over it), browser detection, and pop-up windows.

JPEG (Joint Photographic Experts Group): Refers to an image file format popular for delivery over the Web because of its relatively high quality and low file size. Before uploading JPEGs to the Web, users can determine the amount of compression assigned to them-usually on a scale from 1 to 10. Recommended file type for photographic images.

K

Kernel: The guts of any operating system. The kernel is loaded into main memory and stays there, while other pieces of the OS are loaded in and out of memory. The kernel controls all requests for disk, processor, or other resources. Generally the smaller and faster the kernel, the faster the operating system will operate.

Kiosk: A multimedia display system such as those used in marketing displays at conferences and in stores. Kiosks are typically used for demonstrations and may be self-contained hardware units having computer, video, and audio capabilities.

Kbps (Kilobits Per Second): A measure of data transfer. A 56Kbps dial-up modem transfers data at about 7.2 kilobytes (KB) per second, or about 432 KB per minute.

L

Lag: A condition caused by network congestion. When more traffic is flowing than a network or connection can handle, it causes programs waiting to send or receive data over the network to slow down, or lag. This term is often used to describe a slowdown while playing games online, especially over dial-up modems or any connection with high latency.

LAN (Local Area Network): A local area network or LAN is a group of computers linked together in the same building or nearby buildings. A LAN enables different users to share files, printers, an Internet connection, a database, applications and other resources. The LAN may have a peer-to-peer or client/server configuration. LANs are becoming increasingly standard in small and large organizations alike.

Latency: A measure of how long, on the average, it takes to get a response from something. This term usually refers to network response speed, but can also refer to storage devices (hard drives, CD-ROM drives, etc.).

Learning Object: A reusable, media-independent collection of information used as a modular building block for e-learning content. Learning objects are most effective when organized by a meta data classification system and stored in a data repository such as an LCMS.

Leased Line: A phone line that can be leased from the telephone company with the assurance that the company using it is the only one on the line, thus giving faster data speeds. These lines are often used to connect different branch locations of companies.

Linux: An Open Source, UNIX-like operating system originally developed by Linus Torvalds. Linux is freeware by default, but may be sold for the cost of packaging, bundling, and technical support.

LISTSERV: E-mail list management software developed by L-Soft International. See also e-mail list and mailman.

M

MAC Address (Media Access Control Address): A unique 128-bit address of a network card or device. The first part of the address is unique to the company that produced the device, and beyond that it is a sequence of digits unique to a single device manufactured by a company.

MAN (Metropolitan Area Network): A collection of several LANs that are linked by faster backbone connections. A MAN is smaller than a WAN, and an example is a college campus with several LANs linked on the same network.

Metropolitan Area Exchange (MAE): Large Internet traffic switching station where ISP backbones meet and traffic moves between them.

Mbps (Megabits per second): Megabits: a million binary pulses; commonly used for measuring the amount of data that is transferred in a second between two telecommunication points.

Metadata: Information about content that enables it to be stored in and retrieved from a database.

Metatag: An HTML tag identifying the contents of a web site. Information commonly found in the metatag includes copyright info, key words for search engines, and formatting descriptions of the page.

MIME (Multipurpose Internet Mail Extensions): A data specification which allows non- ASCII files to be sent over the Internet. Email programs (such as Eudora) and Web browsers are configured to interpret a variety of standard MIME types so they can transmit and receive graphics, audio, video, and formatted text files.

MOO (Mud, Object Oriented): A MUD created with an object-oriented programming language.

MP3: A format for music files compression that enables users to download music over the Internet.

MPEG (Moving Picture Experts Group): A series of International Organization for Standardization (IOS) standards for digital video and audio, designed for different uses and data rates.

MUD (Multi-User Dimension or Multi-User Domain): A simulated virtual world in which users interact with each other, often by taking on character identities called avatars. Originally created for game-playing, MUDs are growing in popularity for online learning and virtual community-building.

Multicasting: The transmission of information to more than one recipient. For example, sending an e-mail message to a list of people. Teleconferencing and videoconferencing can also use multicasting.

Multimedia: Encompasses interactive text, images, sound, and color. Multimedia can be anything from a simple PowerPoint slide show to a complex interactive simulation.

N

NAM (Network Access Module): A special jack into which a printer or computer is plugged to connect to a network.

NAT (Network Address Translation): A method that many ISPs use to extend their IP addressing to support more addresses than they own. The interior network uses one addressing scheme, and the exterior network uses the standard IPv4 Internet addressing. NAT devices can be routers, firewalls, or proxy-servers. To program a NAT device you must supply translation rules for how interior IP addresses are displayed to the outside world.

Network: A set of conjoined computers that can share storage devices, peripherals, and applications. Networks may be connected directly by cable connection, or indirectly by telephone lines or satellites, and can be part of a small office system or global web of numerous other networks.

NIC (Network Interface Card): An expansion card that allows a computer to connect to a network.

Newsgroups Usenet Newsgroups: A newsgroup is an electronic discussion group consisting of collections of related postings (also called articles) on a particular topic that are posted to a news server which then distributes them to other participating servers.

O

OCR (Optical Character Recognition): Refers to both the process of scanning text from a printed page into a digital text file and to the type of software that carries this process out.

Open Source Software: Open source software can be distributed freely and users are free to make changes to the source code and modify (or screw up) the program as they please. Many open source software projects, such as Linux, Apache, and FreeBSD, are the work of a team of individuals from around the world.

OS (Operating System): Operating System - the program that, after being initially loaded into a computer by a boot program, manages all the other programs in the computer.

P

PBX (Private Branch Exchange): A telephone system within an enterprise that switches calls between enterprise users on local lines while allowing all users to share a certain number of external phone lines.

PDF (Portable Document Format): Refers to a file format in which formatted documents can be transferred over the Internet. PDF files are readable with Adobe Acrobat Reader.

Peer-to-Peer (P2P) Computing: This is a popular way for Internet users to share one another's computer files—usually music, game, or software files.

Phishing: This scam involves sending a fraudulent e-mail soliciting credit card, Social Security, or other personal information from an unsuspecting user.

Packet: A bundle of data transmitted over a network. Packets have no set size; they can range from one character to hundreds of characters.

PDA (Personal Digital Assistant): Handheld computer device used to organize personal information such as contacts, schedules, and so forth. Data can usually be transferred to a desktop computer by cable or wireless transmission.

PDF (Portable Document Format): File format developed by Adobe Systems to enable users of any hardware or software platform to view documents exactly as they were created — with fonts, images, links, and layouts as they were originally designed.

Peer-to-Peer (P2P) Network: A communication network that enables users to connect their computers and share files directly with other users without having to go through a centralized server. Groove is an example of an application that runs on a peer-to-peer network.

Pixel (Picture Element): Tiny dots that make up a computer image. The more pixels a computer monitor can display, the better the image resolution and quality. On a color monitor, every pixel is composed of a red, a green, and a blue dot that are small enough to appear as a single entity.

Platform: A combination of hardware and system software forming the basis for a computer system. Examples include Macintosh, PC, NT, and UNIX. The term "cross-platform" refers to programs and formats that can be used on more than one platform.

Plug-in: An accessory program that adds capabilities to the main program. Used on web pages to display multimedia content.

PNG (Portable Network Graphics): The patent-free graphics compression format developed by Macromedia expected to replace GIF. PNG offers advanced graphics features such as 48-bit color.

POP (Post Office Protocol): The set of rules and standards that govern the retrieval of e-mail messages from a mail server.

Port: A plug and its associated circuitry in a computer's hardware use for sending data from computer to its peripherals or to other computers. Serial, parallel, and SCSI ports are the names of commonly used ports.

Portal: A web site that aims to be a "doorway" to the World Wide Web, typically offering a search engine and/or links to useful pages, and possibly news or other services.

PPP (Point-to-Point Protocol): A method of connecting a computer to the Internet that connects to a server that is connected to the Internet rather than linking directly to other computers.

Protocol: An agreed upon format for transmitting data between two devices.

Proxy Server: A proxy server stores copies of web pages that you access so that they can be brought up more quickly when you want to access them again. When you ask for a web page, the proxy server checks to see if the web page is stored in its cache. If it is, it returns that copy, without having to access the Internet. The proxy server may be located with the Internet Service Provider that you dial in to, or it may be located on your own server.

Q

QuickTime: A digital audio and video file-format and architecture developed by Apple Computer, Inc. Can be viewed on most computing platforms.

Query: A user's (or agent's) request for information, generally as a formal request to a database or search engine.

R

RAM (Random Access Memory): Temporary storage built into a computer system that functions as a "workspace" for data and program instructions.

Raster Graphic: A computer image made up of a collection of dots. Can become ragged or otherwise distorted when the image is enlarged or shrunk. See also Vector graphic.

RSS (Real Simple Syndication): RSS, also known as Rich Site Summary, is an XML format for distributing news headlines on the Web, also known as syndication. First started by Netscape as part of the My Netscape site.

S

Search Engine: A search engine is a type of software that creates indexes of databases or Internet sites based on the titles of files, keywords, or the full text of files. The search engine has an interface that allows you to type what you're looking for into a blank field. It then gives you a list of the results of the search. When you use a search engine on the Web, the results are presented to you in hypertext, which means you can click on any item in the list to get the actual file. Any of a number of giant databases on the Internet which store data on Web sites and their corresponding URLs. Some popular search engines are Yahoo, Alta Vista, and Excite.

SCORM (Sharable Content Object Reference Model): A set of specifications that, when applied to course content, produces small, reusable learning objects. A result of the Department of Defense's Advance Distributed Learning (ADL) initiative, SCORM-compliant courseware elements can be easily merged with other compliant elements to produce a highly modular repository of training materials.

Screen Reader: Computer software that reads aloud text on the screen. Often used by individuals who are visually impaired.

Section 508: The section of the 1998 Rehabilitation Act that states that all electronic and information technology procured, used, or developed by the federal government after June 25, 2001, must be accessible to people with disabilities. Affected technology includes hardware such as copiers, fax machines, telephones, and other electronic devices as well as application software and web sites.

Server: A computer or device on a network that manages network resources. The server controls software, access to printers, and other parts or functions of the network. The server is usually connected to workstations that share the main system's resources.

Service Provider: A company or agency that provides services or products to your district and sends bills or has a contract with the district.

SIF (Schools Interoperability Framework): A non-profit membership organization comprised of more than 100 software vendors, school districts, state departments of education and other organizations active in primary and secondary (K-12) markets, that have come together to create a set of rules and definitions so software programs from different companies can share information.

SGML (Standard Generalized Markup Language): A set of standards for document markup tags. SGML rules formed the basis for [HTML](#) and is used to manage large documents that are revised frequently, but is not used widely on personal computers.

Spam: Unsolicited e-mail on the Internet.

SQL (Structured Query Language): A language for querying a relational database to search for and process information.

SSL (Secure Sockets Layer): A transport security mechanism that permits private communication between a browser and a Web server. The standard leverages public/private key encryption for an initial “handshake” that positively identifies the server using a digital certificate and passing a shared secret key used to encrypt the rest of the communications between client and server.

Streaming Media (Streaming Audio or Video): Audio or video files played as they are being downloaded over the Internet instead of users having to wait for the entire file to download first. Requires a media player program.

Switch: A device that channels incoming data from any of multiple input ports to the specific output port that will take the data toward its intended destination.

Synchronous Learning: A real-time, instructor-led online learning event in which all participants are logged on at the same time and communicate directly with each other. In this virtual classroom setting, the instructor maintains control of the class, with the ability to "call on" participants. In most platforms, students and teachers can use a whiteboard to see work in progress and share knowledge. Interaction may also occur via audio- or videoconferencing, internet telephony, or two-way live broadcasts.

Sysop (Systems operator): A person responsible for the operations of a computer system or network. Part of such operations are security checks and routine maintenance.

T

T-1: One of the fastest leased-line connections used for the Internet. It is capable of transmitting data at roughly 1.5 million bits per second, still not fast enough for full-screen, full-motion video.

T-3: Similar technology-wise to the T-1 the T-3 is different in that it requires a high frequency medium such as fiber-optic or microwave, to produce their phenomenal speeds. T-3 and “fractional T-3” lines are the highest capacity lines

that are commonly available. With speeds up to 44 Mbps, T-3 lines can replace multiple T-1 lines.

TCP (Transmission Control Protocol): A protocol that makes sure that packets of data are shipped and received in the intended order.

Technology : The utilization of electronic, digital and or telecommunications to provide educational materials, instruction, or assistance to students, educators, or the public.

Technology Plan: A technology plan is a document describing how your organization will use technology to further your mission. A technology plan describes the current technology practices and resources in your organization, and describes how you will upgrade those systems over time to fully meet your needs. The process of technology planning involves assessing your existing resources, defining your needs, and exploring solutions. A successful planning process will draw on management support and the leadership of a technology team made up of a range of staff members to provide input. It will help you budget for technology and make cost-effective purchases. A technology plan is also a key tool to advocate for technology funding.

Telnet: Telnet is a software program that allows you to log in to other remote computers on the Internet to which you have access. Once you are logged in to the remote system, you can download files, engage in conferencing, and perform the same commands as if you were directly connected by computer. You need an Internet account to be able to use a Telnet program, such as the one that comes with Windows.

TIFF (Tagged Image File Format): A widely supported file format for storing bit-mapped images on personal computers. TIFF graphics can be any resolution, black and white, gray-scaled, or color. Files in TIFF format usually end with a .tif extension. TIFF files are often used for archiving high quality versions of an image, such as images intended to be reproduced in print or studied digitally in minute detail.

Trojan Horse: A malicious computer program that appears legitimate but masks a destructive file or application. Unlike viruses, Trojan horses usually do not replicate themselves but can still cause a great deal of damage, such as creating an entryway into your computer for malevolent users.

U

UNIX: A popular multi-user, multitasking operating system developed at Bell Labs in the early 1970s. Created by just a handful of programmers, UNIX was designed to be a small, flexible system used exclusively by programmers. UNIX

was one of the first operating systems to be written in a high-level programming language, namely C. This meant that it could be installed on virtually any computer for which a C compiler existed. This natural portability combined with its low price made it a popular choice among universities.

Upload: To copy data from your computer to another computer over a computer network, the opposite of download.

URI (Uniform Resource Identifier): Name and address of information — text, graphics, audio, video, and so forth — on the Internet. A URI usually identifies the application used to access the resource, the machine the resource is located on, and the file name of the resource. A web page address or URL is the most commonly used type of URI.

URL (Uniform Resource Locator): The global address of documents and other resources on the World Wide Web.

Usability: The measure of how effectively, efficiently, and easily a person can navigate an interface, find information on it, and achieve his or her goals.

UPS (Uninterruptible Power Supply): A backup power unit that provides continuous power when the normal power supply is interrupted. UPS systems can be stand-by (only supplying power when the regular supply is interrupted) or fulltime (relying on regular power and/or batteries for power while it supplies power to the protected device). A UPS is not absolutely necessary on all computer systems, but can be important on systems that must run 24 hours a day without any problems generated by power outages.

V

Vector Graphic: An image created based on mathematical formulas rather than by an array of dots. Vector images look cleaner when they're enlarged or shrunk because the mathematical formulas on which they're based redraw the images to scale. See also Raster graphic.

Videoconferencing: Conducting a conference between two or more participants at different sites by using to transmit audio and video. For example, a point-to-point (two-person) video conferencing works much like a video telephone, using video and audio signals to link participants at different and remote locations.

Virtual: In the context of computing, not concrete or physical. For instance, a completely virtual university does not have actual buildings but instead holds classes over the Internet.

Virtual Classroom: The online learning space where students and instructors interact.

Virtual Reality (VR): An artificial computer-generated environment that is experienced through sensory stimuli and in which special equipment allows the user to interact with the simulation.

Virus: A virus is a piece of programming code inserted into other programming to cause some unexpected and, for the victim, usually undesirable event. Viruses can be transmitted by downloading programming from other sites or be present on a diskette. The source of the file you're downloading or of a diskette you've received is often unaware of the virus. The virus lies dormant until circumstances cause its code to be executed by the computer.

Virus Detection Program: A software program to detect, diagnose, and destroy computer viruses.

VPN (Virtual Private Network): A virtual private network, or VPN, is a Wide Area Network that uses encryption to pass information securely over regular public phone lines. A WAN where computers are connected by public phone lines carrying information over the Internet is not necessarily secure. Many companies set up or lease their own private lines to make their WAN secure, however, this can be very expensive. A virtual private network is a cheaper alternative that will maintain the same security. A private network configured inside a public network.

VRML (Virtual Reality Modeling Language): Pronounced ver-mal, VRML is a specification for displaying 3-dimensional objects on the World Wide Web. You can think of it as the 3-D equivalent of HTML. Files written in VRML have a *wrl* extension (short for world). To view these files, you need a VRML browser or a VRML plug-in to a Web browser.

Viruses: These are software programs that typically arrive through e-mail attachments and multiply on the hard drive, quickly exhausting the computer's memory. A *trojan* is a variation that allows unauthorized users access to the computer, from which they can send infected e-mails or spam.

W

WAN (Wide Area Network): A network that connects computers over long distances via telephone lines or satellite links. In a WAN, the computers are physically and sometimes geographically far apart.

Web: The World Wide Web, or the Web, is the entire collection of web pages or HTML files available over the Internet. Web pages can include links to other web

pages, as well as text, audio, video, and graphics. It can be accessed through a web browser, a software application that enables you to view and interact with web pages. In order to access the Web, you must first be connected to the Internet.

Web Hosting: To host a website is to store the site on a server and make it accessible over the Internet. If you have the technical resources and expertise, it is possible to host a website from your own web server. However, most nonprofits outsource their web hosting. Many Internet Service Providers offer web hosting services. You can also contract with a separate web hosting agency.

WiFi (Wireless Fidelity): An industry standard industry for the interoperability of wireless networking products using the 802.11 protocols. Often used generically to describe any 802.11 wireless LAN equipment.

Wiki: Software that allows users to freely create and edit Web page content, allows the organization of contributions to be edited in addition to the content itself, allows users to create and edit any page in a wiki Web site.

Wireless: An increasing number of companies and organizations are using wireless Local Area Networks (LANs). Wireless transceivers are available for connection to portable and notebook computers, allowing Internet access in selected cities without the need to locate a telephone jack. Eventually, it will be possible to link any computer to the Internet via satellite, no matter where in the world the computer might be located.

Worm: A program or algorithm that replicates itself over a computer network and usually performs malicious actions, such as using a system's resources or shutting down a computer.

World Wide Web (WWW): A graphical hypertext-based Internet tool that provides access to homepages created by individuals, businesses, and other organizations.

WYSIWYG: What you see is what you get.

X

XHTML (eXtensible Hypertext Markup Language): Is a reformulation of HTML as an application of XML. It provides the bridge for web designers to enter the web of the future, while still being able to maintain compatibility with today's HTML 4 browsers.

XML (eXtensible Markup Language): A specification developed by the W3C. XML is a pared-down version of SGML, designed especially for web documents.

It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

XSL (eXtensible Stylesheet Language or eXtensible Style Language): A specification for separating style from content when creating HTML or XML pages. The specifications work much like templates, allowing designers to apply single style documents to multiple pages. XSL is the second style specification to be offered by the World Wide Web Consortium. The first, called Cascading Style Sheets (CSS), is similar to XSL but does not include two major XSL's innovations -- allowing developers to dictate the way web pages are printed, and specifications allowing one to transfer XML documents across different applications.

Z

Zip: A popular data compression format. Files that have been compressed with the Zip format are called Zip files and usually end with a ZIP extension.

- 1) A file that has been compressed, often with the .ZIP format originated by PKWARE.
- 2) A file on a Zip disk, not necessarily compressed.
- 3) A compressed file with the .EXE extension that is self-extracting (can be unzipped simply by opening it).